

756

778

[785]

Rupert hired a shaman to teach him to use his power. The shaman told Rupert that he must fast four days and four nights every spring and fall for four years. On the final day of every fasting period he took some Indian food and placed it in a river or spring. After four years Rupert had his power under control. This shaman, or possibly the one mentioned above who had treated him, told Rupert that an eagle and a little boy were beside him. The eagle was to talk to Rupert during the curing ceremonies and tell him if the patient would recover.

Rupert is occasionally inconsistent. He says that the Hindu boy (sometimes Rupert says that the Hindu is a girl) is not his wegeléyu, but in describing a curing ceremony, Rupert lists his wegeléyus as water, the Hindu, the eagle and the little boy. Because all four of these function as wegeléyu in curing ceremonies, we regard them as wegeléyu. It is interesting that only water wegeléyu came to Rupert in his dream. He learned about the Hindu only when the shaman who had treated him sucked the bone from his forehead. Rupert also learned about the eagle and the boy from another shaman.

[834] Hank Pete's mother was a shaman. She became one before she was married. She ate no meat, grease or salt for four years and demonstrated the strength of her power by walking around in the snow without moccasins. Pete says sexual intercourse was forbidden to people training to be shamans, but this information was given in the course of a general discussion and not when talking about a specific case. Rupert does not mention sexual abstinence. Hank Pete's mother had a group of six people with her whom she was training as shamans. They went about, in Pete's words, like the Salvation Army, praying for the Indians, singing their power songs, and accepting donations of food and perhaps a rabbitskin blanket.

755

756

778

[158]

[753]

Hank Pete told the following story, which he said is true, about a boy's receiving power from the water-baby. A famous shaman, Welukúshkush, frequently took a young boy around with him. One day the boy had a fit and became unconscious on the shore of Lake Tahoe. His parents sent for Welukúshkush whom they blamed for the boy's condition; they wanted to kill Welukúshkush. Welukúshkush said that the boy's soul had been taken by the water-baby and that he could bring back the boy. Welukúshkush had the water-baby for his wegeléyu. Welukúshkush began to shake his rattle and pray. He walked into the water and stayed underneath for 10 minutes, according to Pete. He walked around the boy four times and had the boy's mother call his name four times. The boy began to revive; his nose bled and blood covered his chest. Welukúshkush faced the boy toward the lake and gave him his rattle to shake. Then Welukúshkush walked the boy around in a circle four times. The boy acted as if he had been asleep. After this experience, the boy became a shaman.

SOCIAL FACTORS IN HYPERTENSION AMONG THE WASHO

by Norman A. and Freda L. Scotch

Essential hypertension, accounting for 85 to 95% of all hypertension, is a disease of unknown etiology. Many factors have been studied in relation to its development, among them, 1) heredity, 2) constitution, 3) diet, and 4) social and psychological stress. It is unlikely that any single factor is wholly responsible for hypertension, and medical scholars currently view the disease from a multi-causal framework. 158
121

For at least three decades physicians have suspected a relationship between social factors and the presence or absence of hypertension, or elevated blood pressure. This suspicion has not been buttressed by substantive research, at least until recently, so that systematic research on the possible relation of social factors to the disease is highly desirable. On the other hand, cross-cultural studies of blood pressure measurements have been carried out among many societies throughout the world. Though these studies are not always strictly comparable for a variety of reasons (e.g., different criteria for hypertension, different instruments, sampling problems, etc.) they do give some indication, at least, of the distribution of blood pressure levels throughout the world. Thus one can rate societies on the basis of mean blood pressure levels. Furthermore, one can refer to actuarial studies of the normal limits of blood pressure levels in order to evaluate whether or not the mean levels are "pathologically" high; that is, whether such levels are indications of increased morbidity and mortality.

This paper reports the findings of a pilot study undertaken by the authors among the Washo Indians in the summer of 1954. The whole project was conceived as a small-scale forerunner of a later, larger study to be conducted in South Africa, the results of which have been published elsewhere (Scotch, 1960). Because of the exploratory nature of the Washo research, plus certain methodological difficulties, the findings must be interpreted with caution. [114]

Methods

Material for the analysis that follows comes chiefly from interviews conducted among Washo adults during which certain social data were collected (religion, employment, education, etc.): Blood pressure determinations were 124

Blood pressure determinations were

126 made by the senior author at least three times during each interview, at five
141 minute intervals. Heights and weights were also determined. Interviews
124 were conducted in the homes of respondents.

124 It was hoped at the outset that each adult member of the three Washo
114 communities of Dresslerville, Woodfords and Carson City would be included
in the survey. However, the pressures of time limited the series to 100 persons,
representing approximately 50% of the adult population of these three
communities. All but two or three of the Washo contacted agreed to participate
in the study. Nonetheless, the possibility that the interviewed group was
biased in some manner, such as being more geographically accessible and
therefore socially "different" from non-contacts, suggests that results be
interpreted with caution.

147 For the analysis that follows, a diastolic blood pressure, taken during
128 the initial interview, of 90 mm. Hg. or more was defined as an indication of
hypertension. Tests of significance used in the analysis are based on Chi
squares or T-tests. Findings significant at or beyond the 10% level of confidence
are reported.

Results

147 The mean blood pressure levels of the Washo studied are set out in
158 Table I by age and sex. It will be noted that in this sample blood pressure
increases with age, that the males have higher pressures in the younger ages
and the females higher pressures in the older ages. Further, Washo blood
pressures are high in terms of the criterion traditionally used as an indication
of hypertension -- a reading of 90 mm. Hg. or more for the diastolic --
as indicated by the fact that the mean pressures, particularly of the older
groups, are either very close to, or above, the upper limits of "normal."

TABLE I:
Mean Blood Pressures, by Age and Sex,
for Washo Indians

Age	Males		Females	
		N		N
25 and below	124/79	(5)	119/78	(13)
26 - 45	137/90	(19)	122/78	(20)
46 - 65	133/89	(13)	146/88	(13)
66 and above	157/91	(8)	158/90	(9)
TOTAL	138/91	(45)	132/82	(55)

Nine variables were selected for analysis in terms of their relation to the presence or absence of hypertension. Six of the nine were associated with hypertension at, or better than, the 10% level of significance:

1. Age. Increasing age was associated with an increase in the percentage of elevated blood pressures.

2. Sex. Males have a higher percentage of elevated pressures than do females.

3. Obesity. Using standardized criteria the sample was divided into three groups: normal, overweight and obese. There was a significant increase in the percentage of elevated pressures from the normal to the overweight to the obese groups.

4. Education. The sample was divided into three groups: those who attended schools in the white community, those who attended boarding schools for Indians, and those who had not attended formal schools. The percentage of elevated pressures was highest in the first group and lowest in the last, the differences being statistically significant. No significant statistical association was found between blood pressure and amount of education.

5. Alcoholism. Data were collected on 40 of the males as to whether they were observed by the authors to be frequently drinking or drunk, and whether or not certain key members of the community considered them to be "heavy drinkers." For purposes of analysis they were divided into two groups:

147
158
121
[273]
[77]

alcoholic and nonalcoholic. The alcoholics were found to have a significantly higher percentage of elevated blood pressures than the nonalcoholics.

6. Religion. Members of the sample were questioned concerning their religious affiliation and were placed into three categories: none, Christian (mostly Baptist), and Peyotists. Though there was little difference in hypertension between the Christians and those with no preference, both groups had significantly more elevated pressures than the Peyotists. Three variables did not reach the 10% level of significance.

[177]

7. Residence. Of the three Washo communities studied it was felt that Dresslerville and Carson City represented the greatest degree of acculturation to the dominant white culture, and Woodfords the least. Assuming that stress accompanies acculturation (an assumption not always warranted), we predicted that Dresslerville and Carson City would have a higher prevalence of hypertension than would Woodfords. This was in fact the case but the differences among the three communities were not statistically significant. The prevalence of elevated diastolic blood pressure was 38% in Dresslerville and 39% in Carson City, whereas it was 28% in Woodfords.

[463]

8. Occupation. Hypertension was related neither to type of occupation (ranch workers or construction workers) nor to the difference between seasonal and full time employment.

[623]

9. Involvement in Tribal Council. Past and present office holders of the Washo Tribal Council showed a tendency to have a lower percentage of elevated pressures than other Washo, but this difference did not reach a level of statistical significance.

Because it was felt that some of the associations between elevated blood pressure and selected variables might be due to relationships among variables, a correlation matrix was computed for the six significant independent variables in addition to the dependent variable, elevated blood pressure. The six variables were again found to be significantly related to blood pressure at or beyond the 10% level. Of fourteen intercorrelations, three other sets of statistically significant relationships were found: sex with age, Peyotism with alcoholism and age with school type. Since the males were found to be older than the females this difference may account for the earlier finding of a male preponderance of hypertension. The correlation between Peyotism and alcoholism is negative, and is expected, since membership in the Peyote church is supposed to preclude drinking. Finally, the correlation of age with school type (younger Washo attended the white schools, and older Washo, no school) is also expected since "integrated" schools are a relatively recent innovation in Nevada. Nonetheless, since it had already been

shown that increasing age is associated with increasing percentages of hypertension, the correlation of younger age with white schooling would tend to blur real blood pressure differences between the groups with different educational experiences. To put it another way, the finding that Washo students from white schools had more hypertension than others occurred despite the fact that these were younger Washo, whom we would normally expect to have lower pressures.

Discussion

The long standing hypothesis that stress is associated with hypertension, possibly figuring in its etiology, is supported by the data in the present study. The fact that Washo blood pressure levels are high either when compared to acceptable normal limits, or to mean levels of other societies throughout the world (for a discussion of comparisons of mean blood pressure levels of the Washo with those of a number of other groups, see Scotch, 1957, 42, 93) may be attributed under this hypothesis to the stresses to which the Washo are subject. Chief among these are poverty and the discrimination the Washo face as an extremely small minority group within the dominant white culture of Nevada. Furthermore, gainful employment is extremely difficult to get, first, because there are so few jobs available in Nevada that do not involve gambling enterprises and, secondly, because of discrimination. Further, attempts by the Bureau of Indian Affairs to alleviate the economic situation by such schemes as the relocation plan had met with complete rejection at the time of the study. To our knowledge, not a single Washo had agreed to be relocated despite the many attractive features of the plan. When Washo were interviewed concerning their reluctance to relocate, their typical attitude might be expressed:

"Things are bad enough here where we only have to associate with whites for limited periods of time, but at least we continue to live within the tribe. We maintain many of our customs, and we know and understand our neighbors. But if we agreed to move to a new city we would be torn from our land and tribe and we would have to compete with whites on the whites' home grounds. It is better to suffer from poverty in a situation we are familiar with than to take a chance to make a decent living but live in an unfamiliar situation."

With this kind of attitude is associated a rather pessimistic world view.

147

● 158

The stress hypothesis gains additional support from the relationship of selected variables to hypertension. The six variables found to be significantly related to hypertension represent a mixed bag. Age, sex and obesity are biological variables for the most part, whereas religion, education and alcoholism are social. This is not surprising if one accepts the current view of hypertension as a multi-causal disease. Additionally, the kinds of associations found do not necessarily imply causation. A great deal more epidemiological research must be carried out before we can begin to understand the etiology of hypertension.

With regard to the specific variables studied, the relationships between sex, age, obesity and elevated blood pressure merely support similar findings in the great bulk of studies reported for other societies. The other three variables, however, are of greater interest, particularly as regards the stress hypothesis.

147

158

871

648

It has been indicated that attendance at white schools is positively associated with hypertension, in contrast to attendance at Indian boarding schools, or no formal education at all. It can be argued that attending a white school is a stressful experience for a Washo and, extending the argument, that this stress later reflects itself in increasing blood pressure. Why is such schooling thought to be stressful? In the first place, several of those who have undergone this experience seem to feel it was. Several Washo have expressed bitterness, if not hostility, regarding the treatment they felt they received not only from the teachers of these schools but from the parents of fellow white students as well. It is of some incidental interest that in general these feelings did not extend to the white students themselves but only to their parents. This subjective evaluation of their educational experience seems warranted in the light of the objective situation. According to one white high school principal, Washo students, particularly in the past, did poorly in their studies in contrast to the white students. Furthermore, the principal corroborated the prejudiced feelings of white parents who, in his experience, had objected to the Washo's being allowed to attend the school in the first place, and have since objected to any sort of extracurricular activity that would allow the Washo to associate socially with white children. Interviews with members of the white communities of Minden and Gardnerville, the two white communities closest to Dresslerville, clearly indicate that for the most part these people do not have a high regard for the Washo and do not appreciate their attendance at the same schools. These indications seem to constitute a good case for the stressful nature of the educational experience.

147

158

273

Alcoholic behavior can be interpreted as stressful on two counts: first as a reflection of underlying psychological stresses and anxieties, and second as generating further stress in the form of reaction from white and

Washo society. In other words, the fact that particular Washo become alcoholics indicates certain personality problems of a stressful nature. Once having become alcoholics they are faced with further problems. Other Washo tend to look down on the alcoholics, who then become the subject of malicious gossip for giving a "bad name" to the Washo. In this way, alcoholism, which has been shown to be related to hypertension, may seem to reflect stress.

In contrast to education in white schools and alcoholism, membership in the Peyote cult is seen to be related to normal blood pressures, or an absence of hypertension. Here one can speculate that membership in the Peyote movement tends to be stress-reducing. The psychological and social functions of reform movements such as Peyote have long been noted. For example, Voget (1956, 259) states that these movements:

"... perform a number of important functions in the continuing development and adjustment of the Indian. By providing Indians with a legitimate base for the evaluation of Indian ways, a new dignity and self-confidence emerges. The sense of inferiority and unworthiness which grips the Indian gives way to a bolder and more confident outlook, and he is enabled to face contemporary issues without immobilizing anxiety."

Our own observations among the Washo support Voget's contention. The Washo Peyotists did appear more stable and considerably less anxious than non-Peyotists. Thus the finding that the Peyotists have significantly less hypertension than the other Washo is of some interest.

On the basis of the limited data presented above it may be stated in summary that (1) variables related to social stress are also related to hypertension, and that (2) variables related to attempts to counteract such stressors are also related to an absence of hypertension. This interpretation must, of course, be considered tentative, particularly in view of the failure to find significant relationships between hypertension and some of the variables thought to be important, such as type and continuity of employment.

Studies of social factors in hypertension are currently underway in several societies throughout the world. It is hoped that findings from these studies shed additional light on the nature of the relationship of culture to this disease.

even where Washo and Paiute occupy the same colony, as in Reno, peyotists and nonpeyotists are not friendly and keep to opposite ends of the street."

The unification of peyotists into a small vigorous minority roundly denounced by the majority of Washo-Paiute is one of the most significant features in this acculturation study. To understand it, let us review the opposing opinions and attempt to ascertain their foundations. To learn the bases for the different reactions to the new cult, direct questions were asked. Although individuals may have basic, even subconscious, psychological compulsions which are not exposed by this procedure, we do obtain a valuable understanding of the forces operative in opinion formation. Asking peyotists and nonpeyotists why they believe as they do reveals that the reasons for and against the cult fall into the same categories. Almost every explanation in its support has a counterpart in the statements of the opposition. They can be arranged under medical, religious, ethical, prestige, and economic reasons for acceptance and rejection. Kinship and desire for social contacts also aided the diffusion.

As might be expected from the fact that peyotism was first presented and widely advertised as a curing ritual, the greatest number of arguments in its favor have to do with its therapeutic value. Thirty-seven peyotists told me of more than fifty cures supposedly effected by peyote. Seventeen types were enumerated, ranging from cuts, colds, and headaches to goiter, rheumatism, and tuberculosis, whooping cough, blindness, and hemorrhoids. To the believers, peyote, "just like X-ray," reveals the location of the malignancy and, in some cases, the progress toward recovery.

Distrust of government doctors, nurses, and hospitals, and faith in shamans contributed to this belief in peyote. "Nonmembers, however, fear hospitals as much as do peyotists, some of whom do go to hospitals at times." Most protracted illnesses for which peyote is used have been treated also by white doctors and Indian shamans. Even many nonpeyotists believe that peyote may cure in some cases, shamans in others, and that sometimes even government doctors succeed where others fail. Joe Green considers himself a shaman regardless of participation in peyote meetings, and Tom Mitchell (P.4) "doctors" his wife between meetings. To Joe, peyote is more potent than his shamanistic power, although analogous, just as peyotism is better than Protestantism, although similar."

Opposition to peyote on "medical" grounds takes the form of two beliefs: that peyote causes insanity, and that it actually causes death. Forty-five Indians told me they resist peyote because it leads to permanent insanity. Joaquin Brown's crimes and derangement are cited by Indians from Nixon to Fish Springs (beyond Bishop) in Owens Valley.

When Joaquin espoused peyotism, he did so with the enthusiasm he probably dis-

"The unification of intertribal peyotists in western Nevada and eastern California appears analogous to the Plains practice of intertribal meetings. La Barre states (p. 66) that "at a Shawnee leader's meeting at McCloud there were 12 Kickapoo, 6 Shawnee, 3 Caddo, 2 Kiowa, 2 whites, 1 Wichita, 1 Seminole, 1 Sauk and Fox, 1 Oto, 1 Potawatomi, and 1 Negro."

"See Appendix III for statistics.

"Reported in U. S. Senate Hearings, 1932, 18131-18141, 18202.

"Willie Numbay went to the hospital when he was most active in the cult. Sam Dick's wife Ida was in the hospital in November, 1938, with bladder trouble. Joe Green was at the hospital for trachoma treatments in June, 1939.

"Peyote's appeal on the Plains was also curing. La Barre, 43, states that "doctoring... is a majority of cases in the expressed purpose of calling a meeting," and that "peyote doctoring has been the occasion many times for the spread of peyotism from tribe to tribe." Radin, 1914, 12, found that among the Winnebagos "Have relied principally for new converts upon the knowledge of this great curative virtue of the peyote." Schultze, 1928, 704, states that in the Plains "the medical reputation of peyote has been fundamental in the establishment, spread, and, to some extent, in the maintenance of the peyote cult."

Stewart: Washo-Northern Paiute Peyotism

85 N

played in 1920 when the Mission Record of the Baptist Mission reported: "Joaquin Brown, our Sunday School Chieftain, said, 'I have been very happy today. While I was doing chores I sang Nearer My God to Thee. I felt all day that my life had been changed.'" But when Joaquin visited each family on Fallon Reservation soliciting money for a peyote meeting and demanding attendance, his neighbors only remembered his violent fits of temper, which had provoked him to club a cow to death, cut out a horse's tongue, permanently cripple his son by flogging, and murder his wife with an ax. Although Joaquin had been released from prison because of model behavior after serving two years of his ten-year sentence, most of the Indians feared him. Apprehension heightened when he was converted to peyotism and excitedly attempted to convey his belief to others. In peyote visions he saw his criminal acts, and thinking other peyotists also saw his hallucinations, he talked freely of his crimes. He wished all men to eat the cactus, be cured, and start life anew. When his desire to advance the religion prompted him to threaten white merchants who refused to contribute large sums to the cause, he was arrested and tried for insanity. Indians, fearing retaliation, declined to testify against him and Joaquin was pronounced sane. Local authorities, however, thought him too dangerous to go free; consequently, he was tried and convicted of incest. The man whom Joaquin accused of being the father of his daughter's child died a year before the infant's birth; and Joaquin confessed in peyote meetings to having had sexual relations with his daughter. Under the influence of peyote, Joaquin's son also confessed to incestuous relations with his sister.

Emma D. Powell (P,1) and Sara Baker (P,5) were sent to institutions after attending peyote meetings, and Wally Johns (W,9) was probably eligible for one if accounts of her actions are true. Altogether, seven were judged by the unconverted as completely crazy because of peyote, and three others as temporarily deranged. Two women in the latter category were charged with attempting infanticide. Also, several nonpeyotists accused members of looking and acting irrationally after meetings. When carefully questioned, objectors admitted that most peyotists who became "permanently" unbalanced were "very queer" before eating peyote; and in all cases but one, government records revealed long histories of mental instability. The exception was Henry Jack, named by only three as an example of peyote-caused insanity, yet possessing unmistakable delusions of grandeur, believing himself the son of God and ruler of all western Indians. Johnny Cleveland and five nonpeyotists equate peyote and "muipu" (*Datura meteloides* D. C., or something similar), which, they had heard, made California Indians crazy.

That peyote kills is frequently asserted. It is said that all who had used peyote with Leo Okie died within five years, that all Goshute peyote users died, that three McDermitt Indians died after eating it, and that twenty Washo and Paiute Indians died after using peyote during the first two years of Ben's cult. Two Indians expired in meetings, a half dozen others shortly after, the rest several months after using peyote. So loud were these accusations that government doctors made three post-mortems to see if death may have resulted from administration of some drug besides peyote. All believers allegedly killed by peyote demonstrably suffered from disease or senility which might at any moment have brought death and which figured as the cause in official reports. It is probable, however, that the rigors of peyote meetings hastened the deaths of a few dangerously ill individuals. Except when persistently

* See Stewart, 1933, 318, for use of Jimson weed in Owens Valley. Some similarities with peyote are striking.

* La Barre reports (114) that one Cheyenne opposed peyote because it was used "to witch people and make them crazy" and that a Kiowa apostatized because her daughter died in spite of a peyote ritual.

W
158
795*

N
W
[787]

N
W
[935]

N
W
761
795*